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TP 1624

Marine Casualty Investigations

Enquêtes sur les accidents maritimes

REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES ATTENDING THE GROUNDING OF THE CANADIAN LAKER "BEECHGLEN" IN LAKE SAINT-FRANCOIS, ST. LAWRENCE RIVER ON JULY 19, 1986.

REPORT No. 468

Investigation Report to the Minister pursuant to sections 542 or 545 of the Canada Shipping Act

Rapport d'investigation au Ministre conformément aux articles 542 ou 545 de la Loi sur la marine marchande du Canada

Canada

Ce rapport est aussi disponible en français.

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REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES ATTENDING THE GROUNDING OF THE CANADIAN LAKER "BEECHGLEN" IN LAKE SAINT-FRANCOIS, ST. LAWRENCE RIVER ON JULY 19, 1986.

Particulars of Vessel

Name	"BEECHGLEN"
Official Number	370154
Port of Registry	Hamilton
Call Sign	VGRK
Gross Tonnage	10,542
Registered Tonnage	8,144
Length Overall	207.27 m (680.2 ft)
Breadth	18.34 m (60.17 ft)
Depth	9.76 m (32.02 ft)
Draught (at time of incident)	F: 6.43 m (21' 01") A: 7.47 m (24' 06")
Type	Great Lakes Bulk Carrier
Built	Cleveland, OH, 1923 (Fwd & cargo sections) Sparrows Point, MD, 1942 (Aft Section ex "GULFPORT")
Re-built	1961
Propulsion	Steam Turbine rated at 2,913 kW driving a single fixed pitch propeller
Cargo	14,509 tons of feed wheat
Crew	23
Owners/Operators	Parrish & Heimbecker Limited Toronto, Ontario
Classification	American Bureau of Shipping

Navigating Equipment

Radar (port)	Furuno, model FR 1011 fitted with reflection plotter, 3cm
Radar (starboard)	Sperry Mk 16 A,3cm
Echo Sounder	Furuno, FE Mk 2
Loran C	Internav 123
VHF (1)	Sailor RT 144
VHF (2)	Sailor RT 144B
Gyro Compass	Sperry
Magnetic Compass	One (1)

Description of Vessel

The "BEECHGLEN" is a typical laker with the wheel-house forward and the engine-room aft. She possesses an Inspection Certificate, S.I.C. 19, for an Inland Waters Steamship, Class I, issued on April 8, 1986, and valid until April 7, 1987.

Note: All times in this report are expressed in Eastern Daylight Saving Time (UTC minus 4 hours).

Background

The "BEECHGLEN" was downbound in the St. Lawrence Seaway with a cargo of feed wheat from Thunder Bay to Trois-Rivieres. Delays due to poor visibility were experienced in the early morning in Eisenhower Lock and above Snell Lock. When making an alteration of course in thick fog in Lake Saint-Francois, a small pleasure craft was mistaken on the radar for a spar buoy.

The "BEECHGLEN" grounded outside the Seaway channel near Minguy Island. Repair costs in the order of $0.5 million were incurred in addition to the costs of salvage in offloading and reloading part of the cargo.

Narrative

Thick fog above Snell Lock caused the "BEECHGLEN" to stop and tie up, and as visibility gradually improved, the lock was

entered and then cleared at 0810. The master was again called to the bridge as visibility deteriorated off Dickerson Island (Grass Islet). Approaching Lancaster Bar, the visibility was about one mile. When passing buoys D38 and D39 the course was set at 086°(G), and the vessel was steered in the centre of the Seaway channel. The engine telegraph was rung to 'full ahead' for full manoeuvering; however the main engine had been set at 60 r.p.m. to give a speed of about 8 knots over the ground.

Buoys D36 and D37 were just barely discernible from the wheel-house as they came abeam. Shortly afterwards, the alteration of course to port was started. Both radars were manned but a profusion of small pleasure craft in the area made identification of the channel buoys ahead, and in particular spar buoy D33, difficult. What was judged to be the echo of spar buoy D33 was seen on the starboard bow by radar, and helm orders to decrease the rate of turn were given. The "BEECHGLEN" then grounded outside the starboard side of the channel in position 45°07.7'N and 074°25.0'W. The ship's head was 070°(G) and the time was 1026.

The engine telegraph was put to 'full speed astern' but the vessel would not come free. Soundings of 3.6 m (12 ft) were obtained at the stem. The stern of the vessel was in the Seaway channel.

The St. Lawrence Seaway Traffic Control in the sector and the owners were informed by radio. Traffic was suspended at 1050 but one way traffic in the area of buoys D33 and D35 was permitted at 1125.

A crack was discovered in the bottom of the fore peak tank about 4.5 m abaft the stem. It was about 1.2 m (4 ft) in length running athwartships and opened about 7.6 cm (3"). There was no pollution as a result of this grounding.

Six tugs arrived alongside at 1955, July 19, and attempted to tow the vessel free, but their efforts were unsuccessful. It was decided to lighten the vessel by removing some of the cargo from the forward hold. The lighter was alongside at 1420 on July 20, and transfer of cargo started.

After 1,100 tons had been removed, the "BEECHGLEN" was refloated at 1230 on July 21, and taken to the Saint-Zotique anchorage for further inspection. No further damage was discovered by divers, and permission was given to reload the cargo and continue to Trois-Rivieres to discharge the cargo, thence in ballast to Port Weller for permanent repairs.

Analysis

1. Weather

At the time of the grounding there was no wind, the lake was smooth and the visibility was in the order of 150 m, in fog.

2. Speed

The distance from Snell Lock to the position of the grounding is 18.5 nautical miles. It was travelled in 2 hours, 16 minutes giving an average speed of 8.16 knots over the ground.

3. Current

The current across Lancaster Bar is reported to set fair with the channel at a rate of one knot or less. The flow of water in this area was reported to be heavier than normal.

4. Water Level

The water level at Lancaster Bar was about 0.56 m (22") above chart datum.

5. Channel Width

The Seaway Channel at this turning position is over 300 m (985 ft) wide.

6. Traffic

Apart from the numerous small pleasure craft fishing or moving in the area, the only traffic was the "COMEAUDOC" underway about half an hour up-river.

7. Radar

The port radar set on the "BEECHGLEN" is fitted with a reflection plotter, and there was a supply of chinagraph pencils for use with this reflection plotter. It was capable of being gyro stabilized; but, in common with the prevalent practice on the Great Lakes it was operated in the relative mode, that is, with the ship's head up on the radar display.

The two separate scanners are mounted above the wheel-house on the front of the fore mast, one above the other. The radars were reported to be in good condition and operating properly at the time of the casualty. Both radar sets were

inspected after the grounding while the vessel was in dry dock at Port Weller, and were found to be in good working order. The variable range marker on each set was checked against the fixed rings and shore objects and no error was found.

8. Alteration of course

The attempted use of a floating navigational aid for a radar target as an alteration of course indicator was a navigational error, particularly when it had not been properly identified, and positive shore targets were available.

In the Inland Waters List of Lights, Buoys and Fog Signals, 1986, page III contains the following:

> **Cautions in the Use of Aids to Navigation**
>
> Mariners are cautioned not to rely solely on buoys for navigation purposes. Navigation should be by bearings or angles from fixed shore aids or other charted landmarks and by soundings whenever possible. Buoys should be considered only as warning markers.

The 'wheel-over position' for the alteration of course could have been measured by a radar distance 8 cables from Minguy Island and, as a double check, when the stern of the vessel had cleared buoys D36 and D37, which had been seen and identified visually.

A distance of 4 cables had been chosen for the closest approach to Minguy Island on the 086°(T) course, but it was not properly monitored.

The course alteration was from 086° to 055°, a total of 31°. The ship's head was 070°(G) when the grounding took place with only half the alteration of course accomplished.

9. Navigation

At the time of grounding the "BEECHGLEN" was being navigated by radar in reduced visibility and travelling at reduced speed in narrow waters. When piloting in confined waters in restricted visibility with the assistance of radar, the recommended practice is to use a pre-computed/pre-planned

monitoring of the vessel's position. This technique is used to yield a continuous fix and, especially on shorter range scales is very sensitive to detecting deviations from the desired track over the ground. Such a method was not used aboard the "BEECHGLEN."

After the bridge of the vessel had passed buoy D37, buoys D36, D37 and D35 could be seen on radar and the wheelsman was ordered to alter course to port. Many pleasure craft could be seen in the area of spar buoy D33. As the echo thought to be that of spar buoy D33 moved from port to starboard, the rudder was eased to 10° port helm. Shortly afterwards the vessel grounded.

All navigating equipment in use performed satisfactorily before and after the grounding. The gyro compass had 'nil' error.

10. Spar buoy D33

This is a green steel spar buoy on which there is neither a radar reflector nor a light. The main body is 61 cm (2 ft) in diameter, of which about 30 cm (1 ft) is visible. Above this, the steel pipe is 25 cm (10 in) in diameter and 2 m (7 ft) high. An echo from it would be hard to distinguish on the radar from that of a small aluminum boat. When the weather cleared, about half an hour after the grounding, the echo of the spar buoy could be clearly identified on the radar screen and it appeared similar to the echoes of the small boats in the area.

11. Watchkeeping personnel

From 0810 until 1000, the first mate piloted the vessel and the third mate acted as officer of the watch. The master was called to the bridge prior to 1000, at which latter time the first mate who had the conduct of the vessel, was relieved by the second officer. The third officer continued as officer of the watch and made use of the port radar, whilst the second officer used the starboard radar and gave helm orders to the wheelsman. The master was stationed at the centre window of the wheel-house and was being informed of the progress of the vessel by the second officer. Although the master was present, the second officer retained the conduct of the vessel.

12. Fatigue

The second and third officers were well rested, but the master appeared to have been suffering from fatigue. After

being up all night piloting the vessel through the Welland Canal, he was able to take only about 5 hours rest after the "BEECHGLEN" cleared Port Weller Piers at 0707 on July 18. Rain and haze prevailed all afternoon and, because of this, the master was unable to relax as the vessel crossed Lake Ontario, arriving at Tibbets Point, the entrance to the St. Lawrence River, at 1915. From this point until clearing Snell Lock at 0810 on July 19, he had about an hour's rest in an easy chair.

On clearing Snell Lock, the first mate took over the pilotage. However, the master managed to get less than an hour's sleep before being called again to the bridge at Dickerson Island (Grass Islet) because of the poor visibility.

The Safe Manning Regulations state in part, under the heading 'Hours of Rest':

> 4. (1) Subject to subsection (2), on every ship, other than a fishing vessel,
>
> (a) the complement shall be sufficient, and
>
> (b) a watchkeeping system or work system shall be established
>
> to ensure that the master and every other person referred to in subsection 6(1) shall have a period of rest of not less than 6 consecutive hours in every calendar day he is employed on that ship.
>
> (3) Not more than 18 hours and not less than 6 hours shall elapse between the end of a period of rest described in subsection (1) and the beginning of the next such period of rest.
>
> (4) Every person referred to in subsection (1) shall have at least 16 hours of rest in the aggregate in every 2 consecutive calendar days he is employed on a ship.

While not actually directing the course of the vessel at the time of the casualty, over 22 hours had elapsed without the master having been able to obtain a proper rest period.

13. Refloating and Damage

The following six tugs were used in an attempt to refloat the "BEECHGLEN": the "JAMES BATTLE", "ARGUE MARTIN", "STORMONT", "GLENEVIS", and "HELEN MCALLISTER". Since these efforts were unsuccessful, 1,100 tons of cargo were discharged from No. 1 hold into "P.S. BARGE NO. 1" and the same six tugs were then able to refloat the vessel. She was escorted to the Saint-Zotique anchorage where, following inspection, the cargo was reloaded.

In addition to the crack in the bottom of the fore peak tank situated 4.5 m from the stem, the bottom plating was distorted for a distance of 27 m (90 ft) on the port side and 36 m (120 ft) on the starboard side. The associated internals were also set up.

14. Qualifications and experience of personnel

The master of the "BEECHGLEN" holds a Canadian Master Inland Waters Certificate of Competency issued in March 1960 and endorsed First Mate Home Trade in February 1970. He commenced his sailing career in 1948, and has been master on the Great Lakes since 1967. He had five years permanent command on the "BEECHGLEN" from 1975 to 1980 and among other duties, 2 years as relief master. The master had taken two Marine Safety International Simulator St. Lawrence River Training courses, sponsored by the Dominion Marine Association at the La Guardia airport, New York in 1979 and 1980.

The second officer of the "BEECHGLEN" holds a Canadian CN II Certificate of Competency issued in June 1986 which allows him to be employed as First Mate on any steamship engaged on Inland Waters voyages. He commenced his sailing career in 1965, and obtained his Watchkeeping Mate's Certificate in June 1976. A prerequisite for this latter examination is attendance within the preceding 30 months of a Simulated Electronic Navigation (SEN I) Course. He has been an officer for 10 years and entrusted with the piloting in the Upper St. Lawrence for four years. This was his second season on the "BEECHGLEN".

The third mate holds a Canadian Certificate of Competency as Master of an Inland Waters Steamship obtained in 1959. He has been sailing since 1947 and was in command on the Great Lakes from 1959 until 1980. He joined the "BEECHGLEN" at the beginning of April 1986.

Neither the master nor the third officer has taken a Simulated Electronic Navigation Course since obtaining their

Canadian Certificates of Competency.

Findings

While downbound in the St. Lawrence River, and altering course in fog off Pointe Dupuis in Lake Saint-Francois, the Canadian laker "BEECHGLEN" grounded outside the Seaway channel on July 19, 1986, as a result of an error in judgement in the navigation of the vessel.

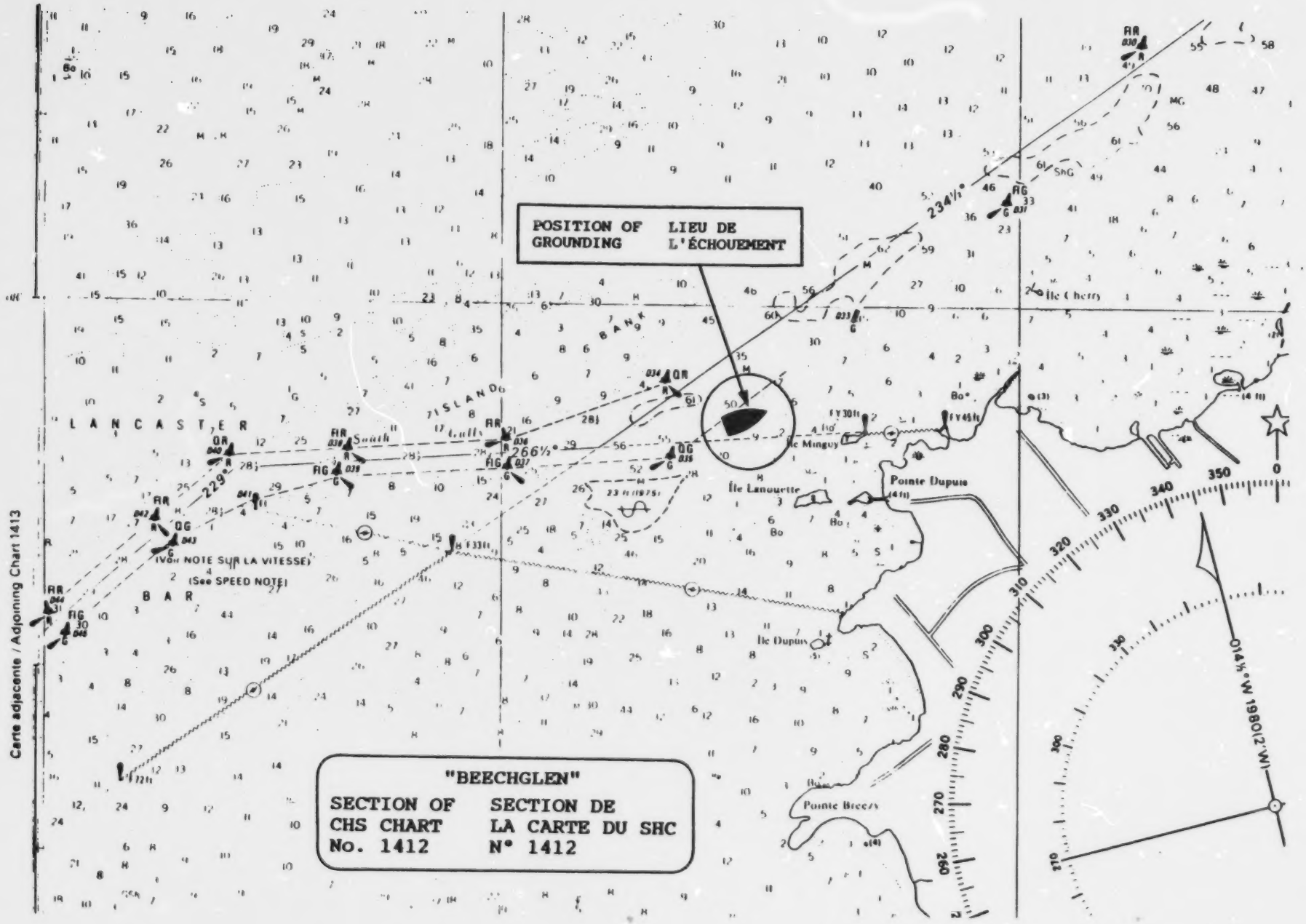
It would appear that the following factors contributed to the grounding:

- the visibility was extremely poor due to fog;
- the alteration of course to port was started too late;
- undue reliance was placed on buoys for navigation purposes;
- positive radar targets were not used in that a small pleasure craft echo on the radars was mistaken for spar buoy D33; and
- in navigating by radar, the progress of the vessel was not accurately tracked against the chart, either by parallel-indexing or by a regime of 'blind pilotage' plotting.

Other Findings

The master was suffering from fatigue and not fully attentive/alert to the situation.

OTTAWA, ONTARIO
APRIL 1987.


POSITION OF GROUNDING
LIEU DE L'ÉCHOUEMENT
"BEECHGLEN"
SECTION OF CHS CHART No. 1412
SECTION DE LA CARTE DU SHC N° 1412
Carte adjacente / Adjoining Chart 1413
LANCASTER
BAR
ISLAND
(See SPEED NOTE)
(Voir NOTE SUR LA VITESSE)
Île Mingan
Île Lanouette
Île Dupuis
Pointe Dupuis
Pointe Breezy
Île Cherry
234½°
266½°
229°
0144½° W (1980) W

"BEECHGLEN" aground. "BEECHGLEN" échoué.

Point Dupuis lighthouse
Phare de Pointe Dupuis

Ile Minguy lighthouse
Phare de l'île Minguy